

# ON THE TREATMENT OF FRACTURE OF THE MANDIBLE.

WITH METHOD OF WIRING.

BY STEWART LEROY MCCURDY, M.D.,

OF PITTSBURG, PA.,

Professor of Orthopaedic and Clinical Surgery, West Penn Medical College; Professor of Anatomy, Oral and General Surgery, Pittsburg Dental College; Orthopaedic Surgeon, Presbyterian Hospital.

It is not necessary here to do more than mention the various methods that have been recommended and used for the treatment of fracture of the mandible. They may have been efficient in the hands of their inventors, and have had and will have advocates and resuscitators throughout time. To say the most for them, they are in many instances failures, in others partially successful, while some methods are quite successful in selected cases.

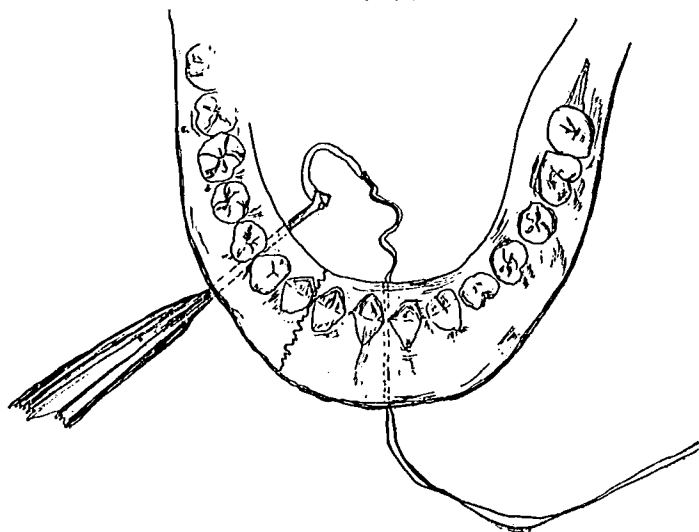
The Barton bandage as originally recommended, or as modified by Hamilton and Garretson, is pretentious, but does not hold fragments in position when there is a tendency to displacement. The interdental splint is a dental stunt, that makes a sewer of the mouth, a cavity for the culture of foul putrefactives, without furnishing any mechanical forces to hold the bones in position, but it rather by its interposition between the teeth tends to throw the fragments out of angle, and is not so good a splint as the upper teeth themselves. Wires about the teeth and the bands, screws, and bolts of Angle, and the wire splint of Weston & Kingsley are satisfactory in many instances; but all devices which have as their anchorage the normal teeth must necessarily be unstable when teeth do exist and impracticable when teeth are not conveniently located.

The treatment that will guarantee an adjustment of the fragments by a mechanism that maintains such adjustment throughout the period of repair is one that should recommend

itself to surgeons. The writer has operated on many cases, using a method of wiring similar to that practised in extremity surgery, with uniform success.

The method consists in drilling a hole through the mandible from the external surface of the bone into the sublingual cavity. The drill hole should be made between the apices of the second and third teeth from the lines of fracture, when this

FIG. 1.

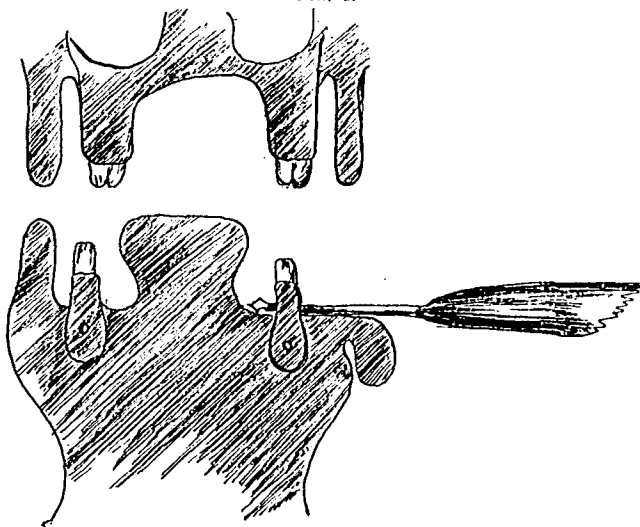


Wiring fractured mandible.

is possible, so as to guarantee firm anchorage for the wires. After the drill holes are made, they are threaded with a notched drill. The wire is now passed through from without into the mouth on one side, and with the thread through the drill hole on the other side it is drawn out (Figs. 1 and 2). The two ends of the wire are now drawn out firmly, and the loop on the inside of the bone is moulded to the surface of the mucous membrane. The free ends are twisted so as to bring the ends of the bones in perfect apposition. The wire is now

turned up along the remaining teeth, so that the sharp end may not irritate the mucous membrane of the lip. When one side has a tendency to drop, the drill holes should not be on the same plane; but, instead, the hole in the high fragment should be well up to the gingival margin, and the one in the lower fragment close to or below the dental canal. In some instances it will require but one hole, the teeth being used for anchorage. This is usually the case in fractures near the angle.

FIG. 2.



Method of passing drill through mandible.

The wires are permitted to remain in position for about six weeks, or longer if union has not taken place. They cause no irritation, sloughing of the gum or mucous membrane to speak of, as might be supposed; and if necrosis of the bone from pressure of the wire ever occurred in my cases, it was too insignificant to attract attention. Bandages and swaddling-cloths are not necessary. The patient soon learns to hold the teeth together. If infection occurs, an ice-cap should be applied directly to the face. Under this treatment suppuration seldom

occurs. The mouth should be cleansed with some strong antiseptic, as borolyptol, every hour or so. Before the adjustment of the fragments, the field should be thoroughly cleansed with 50 per cent. solution of alcohol. Iron wire is always used, since it is tougher, less irritating, and in every way superior to silver wire.

The method of feeding these patients is always a question of some concern. In cases where no teeth have been removed, it has been suggested that a tooth be extracted before adjustment of the teeth; but this has not been found necessary in a single instance. The method used has been to pass a curved glass tube back of the back teeth into the mouth; a fountain or other syringe can be used to force liquids into the oral cavity. In many cases the patient can suck the liquid from a glass with ease, provided the tube is made with sufficient curve to permit closure of the lips properly.

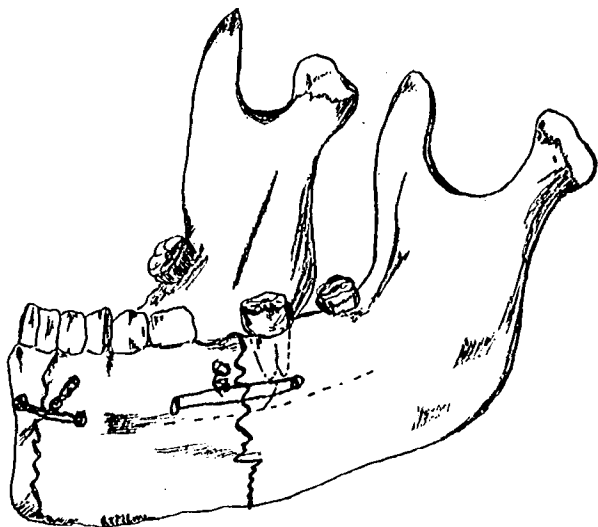
CASE I.—Fracture of the mandible through the last molar. There was a complete lateral displacement. The posterior fragment was resting on the outside of the body of the bone, and the ends of the bone were overlapping for some distance. The writer saw the case on the fifteenth day, and the soft tissues had repaired some, so that it was impossible to reduce the displacement through the mouth even under an anæsthetic. An incision was made parallel with the inferior margin of the mandible immediately over the fracture, the soft structures lifted from the bone so as to admit a strong bone elevator into the space in front of the anterior end of the posterior fragment. While the bones were pinched free from each other, great traction was made upon the mandible forward and inward pressure against the angle. In this manner the bones were reduced. Repair took place without a particle of deformity. Wiring in this case could not be done through the mouth in the usual way. A superficial wire was passed through the bones along the inferior border of the bone.

CASE II.—Patient sustained a fracture of the mandible by having a wheel pass over his face. The fracture was through the mental foramen on the left side. The case came to the writer fifteen days after the accident. There existed a dis-

charging sinus through the skin along the inferior margin of the bone. This case was wired according to the method above described. The bones were held in absolute position by the wires. The sinus closed, and at the end of six weeks the wire was removed, the patient having made a complete recovery without deformity or further necrosis.

CASE III.—Patient sustained a multiple fracture of mandible as a result of a fall from a bicycle. The first fracture was

FIG. 3.



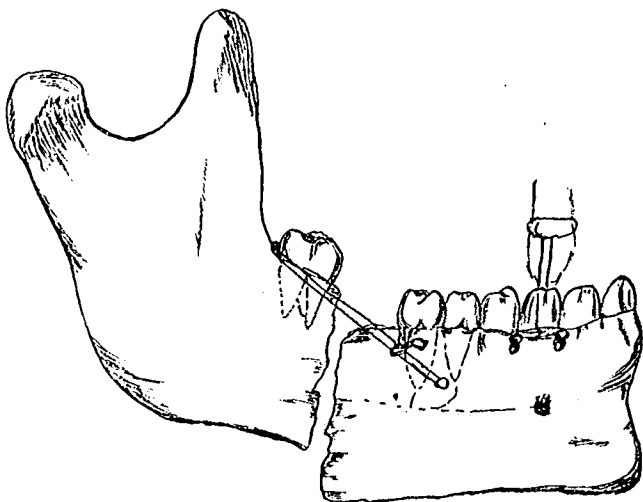
Multiple fractures of mandible.

slightly to the right of the symphysis, and the second was through the first bicuspid on the right side. At the time the case came to the writer, which was three weeks after the accident, there was extensive suppuration along the line of fracture, and a discharging sinus through the skin over the centre of the fragment. Wiring was done as shown in Fig. 3. After the removal of a couple of small fragments of dead bone the wound healed, perfect union occurred, and the patient was practically as good as before the accident. Wire was removed in seven weeks.

CASE IV.—Patient fell under wagon and wheel passed over face, fracturing jaw through symphysis. Case was seen on the twelfth day. Wiring was immediately done. There had been considerable infection, and a sinus existed through the skin slightly to the left of median line. During wiring the sinus curetted the ends of the fragments freshened. Union followed and articulation was practically perfect.

CASE V.—A Slav, referred to me by Dr. Kramer, of Uniontown, Pa., had sustained a fracture at a christening a few days before. The posterior fragment was tilted up by the masseter,

FIG. 4.



Showing method of obtaining upward and backward traction.

leaving a downward displacement of about half an inch. The object in wiring was to pull the anterior fragment upward against the posterior. Since the molar was perfectly solid, it served for an anchorage. The drill was passed through between the roots of the bicuspids. This furnished an upward and backward traction, and a perfect adjustment was not difficult (Fig. 4). Union followed, and the wire was removed in six weeks, with perfect articulation and no external deformity.

CASE VI.—Was kicked by a horse, resulting in the greatest displacement I have seen in any case. Wiring was done and a very satisfactory adjustment secured. Infection followed, resulting in great swelling of face and neck. Under ice-cap this was controlled. Repair was complete in six weeks, when the wire was removed. Articulation practically perfect.

CASE VII.—Fracture from fist blow in fight. Displacement was very slight and drilling of bone was not necessary. The teeth furnished sufficient anchorage, and union followed without complication.

CASES VIII and IX are similar to Case V. Were uneventful, repair occurring in both cases with practically no deformity.

CASE X.—Boy aged three years; was kicked in the face by a horse, resulting in fracture through the central part of the body of the mandible on the left side. A Barton bandage with an external vulcanite splint was adjusted by the family physician, and an interdental splint was made by a local dentist. These were ineffectually used for nine days, when the writer saw the case. After anæsthetizing the patient, a notch drill was passed through the bone in front of the second tooth anterior to the fracture, and the second hole back of the first tooth, from the outside, and the bones wired in the usual method. Union followed without complications.

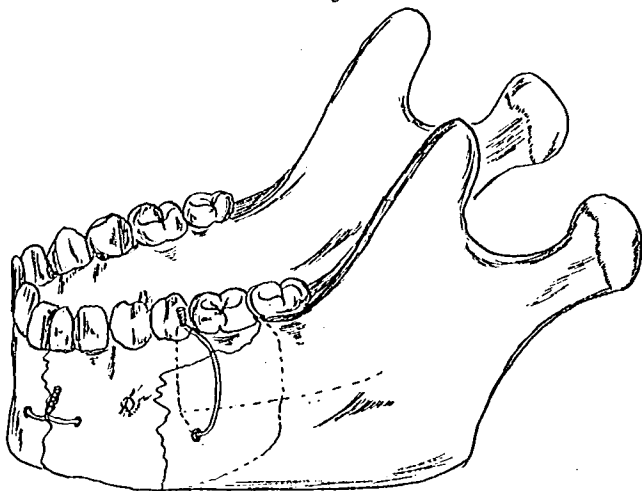
CASE XI.—Resulted from blow from a piece of steel. In this case the displacement was great, and the only way that the mandible could be held in place was by anchoring it to the upper teeth (Fig. 4). The drawing shows the fragments separated, so that the line of traction necessary to draw such displacement together might be seen. Repair followed. The teeth came together throughout after extraction of the molar in the posterior fragment.

CASES XII and XIII were uneventful, and repaired with functional usefulness.

CASE XIV.—Was that of a boy aged seventeen, whose face was caught by the drop shute of a coal-tipple, resulting in two fractures of the mandible; the first being through the angle on the left side, and the second passing obliquely across from without inward and forward, beginning at the first bicuspid and ending at the first incisor on the same side. This case was not seen until

the ninth day, after the ordinary mechanical methods had been used without success. Since the fracture was quite oblique, but one drill hole was made through the bone, and the wire brought up over the alveolus and twisted with sufficient force to hold the fragments in position. After wiring of the anterior fracture by the usual method, there was no tendency to displacements of the fragments at the posterior fracture, and repair took place with but slight deformity.

FIG. 5.



Ends of wire brought over alveolar process.

CASE XV.—Was an oblique fracture, including three teeth in the break; wiring consisted in passing the drill obliquely through the bone at the right angle to the line of fracture, but one hole being required. The ends of the wire were brought over the alveolar process and twisted on the outside of the teeth (Fig, 5). Union followed and no deformity resulted.

CASE XVI.—Was caused by falling upon the tip of the chin. Wiring was done as in the other cases, and union followed without deformity.